Child-Resistant Packaging for Tablets

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Ins B1 B1 The invention concerns a child-safe packing for tablets, capsules and similar pharmaceutical products with a blister pack with at least one cup to hold the tablets or capsules sealed by a push-through cover film.

The danger of unsupervised consumption of drugs is undisputed, where in particular small children are greatly exposed to this potential risk especially when drugs are left lying around.

Blister packs have become the predominant form of packaging for tablets and capsules. Push-through packs, in which the tablets are pushed through a cover film from a cup in the base of the packing, have become very common. In other known blister packs a cover film is removed by peeling. Other blister packs have a notch as a tear aid.

The possibilities exploited today for increasing the child-safety of the said blister packs for tablets and capsules consist of rendering opening more difficult by measures which require increased force, e.g. thicker push-through films, stronger adhesion of peel films or high tear resistance at tear notches.

Packs which can only be opened with increased use of force are indeed child-safe but can constitute a problem for the elderly.

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Ins B3 B3 The invention is therefore based on the task of creating a child-safe packing of the type described initially which can easily be opened by the elderly. Essentially, the packing is structured such that its opening requires a combination skill, or simultaneous or complex movements must be performed.

Ins B4 B4 The task according to the invention is solved in that the blister pack is arranged in an outer pack between a base part and a cover part, where the cover film of the blister pack faces towards the base part and the base part has a removal opening optionally covered by a push-through opening seal, and in that the cup of the blister pack is movable and guided in an opening slot in the cover part and can be brought over the removal opening in the base part to push through the cover film and remove the tablets.

Opening the packing according to the invention requires a combination ability in

the sense that it must be perceived that to press the tablets through, the cup must be brought over the removal opening.

Ins B5 ~~Preferably, a tear-off strip at least partly covering the opening slot and separable by way of a weakening line, preferably a perforation line, is connected with the cover part.~~

In a suitable design of the packing according to the invention, projections protrude inwards from the edge of the opening slot inhibiting the free movement of the cup.

Advantageously, the blister pack is connected with a spring element countering the sliding movement. Preferably, this spring element is part of the blister pack.

In a particularly low cost production variant the outer pack consists of a single cut-out.

A double pack can be produced in a simple manner from two symmetrically arranged mirror part packings.

At least two packings can be combined into multi-portion packs, where the individual packings are arranged next to each other in a strip pack and preferably can be separated from the strip pack along a weakening line, preferably a perforation line.

Ins. C1 For production of the packing according to the invention, rigid, semi-rigid and flexible materials known today for the production of packing, in the form of sheets, films, laminates or other layer materials in a thickness from a few mm to a few mm, preferably 8 mm to 3 mm, can be used. Examples of film-like materials are metal foils such as for example aluminium foil. Other examples of film-like materials are paper, semi-cardboard and cardboard. Particularly important are plastic-containing films e.g. those based on polyolefins such as polyethylenes or polypropylenes, polyamides, polyvinyl chloride, polyesters such as polyalkylene terephthalates and in particular polyethylene terephthalate. The plastic-containing films can be monofilms of plastics, laminates of two or more plastic films, laminates of metal and plastic films, laminates of papers and plastic films or laminates of paper and metal and plastic films. The individual layers of the film-like materials can be attached to each other by means of adhesives, pastes, adhesive promotion agents and/or by extrusion coating, co-extrusion or laminating

C1 etc. Suitable plastic films are for example non-oriented or axially or biaxially oriented monofilms or laminates of two or more non-oriented or axially or biaxially oriented films of plastics based on polyolefins such as polyethylenes or polypropylenes, polyamides, polyvinyl chloride, polyesters such as polyalkylene terephthalates and in particular polyethylene terephthalate, cyclo-olefin-copolymers (CO) and polychloro-trifluoroethylene (PCTFE, trademark ACLAR).

Ins.C2 Particularly suitable for the base parts of blister packs are transparent plastics with good moulding properties such as polyethylene, polypropylene, cyclo-olefin-copolymers (COC), polyvinyl chloride, polyethylene terephthalate, polyamide and laminates made from the said materials e.g. PVC and polychloro-trifluoroethylene (PCTFE) or PVC and PVDC (polyvinyldichloride). For non-transparent blister packs for example laminates are used of an aluminium film coated on both sides with a plastic film with for example the structure polyamide/aluminium/PVC or pigmented plastic films. The cover film is usually an aluminium film of for example a thickness of 20 mm which can be painted and/or coated with a hot seal lacquer.

Ins.C3 All the above film-like materials such as paper, semi-cardboard, cardboard and plastic films in the form of monofilms, laminates etc. can have at least one further continuous layer of ceramic materials sputtered or deposited from a vacuum in a thickness of approximately 5 to 500 nm (nanometers) for example Al_2O_3 or SiO_x, where x is a Figure between 1.5 and 2. These layers of ceramic materials have barrier properties and prevent the diffusion of gases and water vapours through the packing.

Further advantages, features and details of the invention arise from the description of preferred embodiments below and the drawings; these show diagrammatically

- Fig. 1 a longitudinal section through a blister pack with outer pack;
- Fig. 2 a top view onto the outer pack of Fig. 1 in direction y;
- Fig. 3 a top view onto the opened outer pack of Fig. 1 in direction y;
- Fig. 4 a longitudinal section through the blister pack with opened outer pack of Fig. 3 in the removal position;
- Fig. 5 a top view onto a cut-out for production of the outer pack in Fig. 1;

- Fig. 6 a top view onto a blister pack with integral spring element;
- Fig. 7 a top view onto the blister pack of Fig. 6 with spring elements under tension;
- Fig. 8 a longitudinal section through a blister pack structured according to Fig. 1 with outer pack as a double packing;
- Fig. 9 a top view onto a blister pack with outer pack in Fig. 1 structured as a multi-portion pack.

Ins. C4

An outer pack 10 shown in Figs. 1 to 4, of for example cardboard for a blister pack 12 of essentially strip-like structure, has a base part 14 and a cover part 16. The blister pack 12 - in the example shown a single portion pack for a tablet 18 - has a base part 20 of for example polyvinyl chloride (PVC) with a cup 22 moulded from this to hold the tablet 18, and a cover film 24 of for example aluminium sealed or glued to a base part 20. The base part 20 of the blister pack 12 in the area of the cup 22 forms a peripheral shoulder 26 with a diameter s and is connected as one piece with a spring strip 28.

The cover part 16 of the outer pack 10 is formed as one piece with the base part 14 and with this forms a loop where the cover part 16 and base part 14 lie opposite each other, approximately parallel, forming an intermediate space 17. The cover part 16 has an opening slot 30, the width t of which is less than the diameter s of the shoulder 26 of the cup 22 but greater than the diameter u of the cup 22 in the area of the base part 20. When the outer pack 10 is closed, the opening slot 20 up to the area of the cup 22 is connected with a tear-off strip 32 arranged integrally in the cover part 16 with the tear tab 34 and releasable from the cover part 16 by way of a weakening line or linear perforations 36.

The blister pack 12 is arranged in the outer pack 10 so that the shoulder 26 of the base part 20 protrudes sideways in the edge area of the opening slot 30 into the intermediate space 17 between the base part 14 and cover part 16, where the cup 22 protrudes outward from the plane of the cover part 16. In the base part 14 of the outer pack 10 is provided a removal opening 38, when viewed from above lying within the opening slot 30 and covered by the tear-off strip 32.

To remove the tablet 18 the tear-off strip 32 is held at the tear tab 34 and separated from the cover part 16 by an opening movement in arrow direction A,

creating the opening slot 30. The tear tab 34 arranged in the area of the cup 22 in the example shown can evidently also be provided on the side of the tear-off strip further away from the cup 22, where in this case the opening movement takes place towards the cup 22. The cup 22 protruding from the cover part 16 can now - for example by a movement with the thumbs - be pushed along the opening slot in arrow direction B until the cup 22 is above the removal opening 38 in the base part 14 of the outer pack 10. In this position, the removal opening 38 - separated only by the cover film 22 - lies free opposite the tablet 18 in the cup 22. In this open position the tablet 18 can be pushed by finger pressure on the cup 22 in arrow direction C through the cover film 24 and ejected through the removal opening 38. The removal opening 38 can also be covered by a push-through opening seal. This additional seal is for example bordered by a weakening line e.g. a perforation line, and is separated at the same time as the cover film 24 is pushed through.

The movement described above of the cup 22 within the opening slot 30 takes place against the return force of a spring strip 28 which deforms into a resiliently tensioned loop 40 according to Fig. 4 so that the cup 22 after release returns automatically to the starting position. In the area of the cup 22 on both sides of the opening slot 30, open even when the outer pack 10 is closed, projections 42 protrude inwards from the cover part 16. These projections 42 inhibit the free movement of the cup 22 in the direction of removal opening 38 after the tear-off strip 32 has been pulled away, i.e. movement of the cup 22 into the removal position requires first a certain force to displace the projections 42 protruding into the opening slot 32.

The essentially strip-like cut out for the outer pack 10 shown in Fig. 5 shows the weakened and therefore easily separable connection between the tear-off strip 32 with tear tab 34 as a perforation line 36 in the cover part 16. The blister pack 12 with spring strips 28 already lies on the base part. The outer pack is closed by folding the cover part 16 in arrow direction D about a fault line d until the cover part 16 lies on the base part 14 or blister pack 12. With this step there is at least partial adhesion of the edge part 42 of the cover part 16 with the edge parts 46 of the base part 14 to form the intermediate space 17 serving as a guide for the shoulder 26 of the cover 22.

Figs. 6 and 7 show another possibility for generating a return force for the cover 22 in the opening slot 30. The spring strip 28 is here fitted with notches 48

arranged alternately on both sides so that the spring strip 28 can be extended in the strip direction forming a spring tape 50 generating a return force. In this variant the spring strip 28 is attached to the end of the outer pack 10 lying closest to the head 31 of the opening slot 30. The spring strips 28 with notches 48 can be made directly from the material of the base part 20 and/or the cover film 24 of the blister pack 12. It is however also possible to produce the spring strips 28 separately and connect these to the blister pack 12. Instead of a spring strip 28 evidently another spring material for example a rubber band can also be provided.

An outer pack 60 shown in Fig. 8 for blister pack 52 - in the example a two portion pack for two tablets 18a, b - is essentially made from outer packs 10 according to Fig. 1 arranged mirror symmetrically to each other. The same parts therefore have the same reference numbers, where the double structure is indicated by the suffix a or b. The base parts 14a, b are connected together as one piece and with the cover parts 16a, b in each case form a loop. In the closed position the two outer packs 10a, b lie either side of a mirror symmetry plane S. The two part outer packs 10a, b can be opened in the same way and the tablets 18a, b removed in the same way as in the outer pack 10 shown in Figs. 1 to 5.

Fig. 9 shows a strip-like packing 70 with six individual packs according to Fig. 1 arranged next to each other. These can be separated from each other by linear perforations 72. The individual outer packs 10 can however also be opened without needing to be separated from the packing strip 70. Such a strip arrangement is also suitable for the outer pack 60 with a two-portion blister pack 62 according to Fig. 8.

A further advantage of the packing according to the invention is that the printable surfaces for the application of consumer information can be enlarged considerably.